

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A steering control apparatus for an automotive vehicle, comprising:

a camera photographing a travel path in a traveling direction of a vehicle;

a lateral displacement calculating circuit that calculates a lateral displacement of the vehicle with respect to the travel path according to an image of the travel path photographed by the camera;

a differentiator that calculates a differential value of the lateral displacement;

a vehicle speed sensor that detects a vehicle speed;

a relative yaw rate calculating section that calculates a relative yaw rate with respect to the travel path of the vehicle on the basis of the lateral displacement, the differential value of the lateral displacement, and the vehicle speed;

an actuator that provides an assistance force for the steering mechanism; and

an actuator controlling section that drivingly controls the actuator in a direction toward which the relative yaw rate is cancelled on the basis of the relative yaw rate, wherein the actuator controlling section outputs a steering torque command value to the actuator, the steering torque command value being a sum of a steering quantity in accordance with the driver's steering operation and the vehicle speed and a stability direction quantity calculated on the basis of the calculated yaw rate.

2. (Original) A steering control apparatus for an automotive vehicle as claimed in claim 1, wherein the lateral displacement calculating circuit comprises: a white line recognition circuit that recognizes white lines located on both ends of the traveling path; a center position calculating circuit which calculates a center position between both ends of the travel path; and a deviation quantity calculating circuit that calculates a lateral displacement of the vehicle with respect to the center position of the travel path.

3. (Original) A steering control apparatus for an automotive vehicle as claimed in claim 2, wherein the white line recognition circuit recognizes the white lines a predetermined distance ahead of the vehicle and the deviation quantity calculating section calculates a variation rate of a relative angle between the center position of the white line and the vehicle.

4. (Cancelled)

5. (Original) A steering control apparatus for an automotive vehicle as claimed in claim 1, wherein the differentiator comprises a filter processing circuit.

6. (Cancelled)

7. (Previously Presented) A steering control apparatus for an automotive vehicle, comprising:

a camera photographing a travel path in a traveling direction of a vehicle;

a lateral displacement calculating circuit that calculates a lateral displacement of the vehicle with respect to the travel path according to an image of the travel path photographed by the camera;

a differentiator that calculates a differential value of the lateral displacement;

a vehicle speed sensor that detects a vehicle speed;

a relative yaw rate calculating section that calculates a relative yaw rate with respect to the travel path of the vehicle on the basis of the lateral displacement, the differential value of the lateral displacement, and the vehicle speed;

an actuator that provides an assistance force for the steering mechanism; and

an actuator controlling section that drivingly controls the actuator in a direction toward which the relative yaw rate is cancelled on the basis of the relative yaw rate,

wherein the actuator controlling section outputs a steering torque command value to the actuator, the steering torque command value being a sum of a steering assistance quantity calculated on the basis of a steering torque and the vehicle speed and a stability direction steering quantity calculated on the basis of the calculated relative yaw rate, and

wherein the actuator controlling section comprises a relative yaw rate controlling section comprising:

a differentiator that differentiates the lateral displacement;

a pseudo differentiation filter constituted by a predetermined forward distance (L) and the vehicle speed; and

a control gain section that provides a control gain in the direction toward which the relative yaw rate extracted from the pseudo differentiation filter is cancelled and outputs the stability direction steering quantity.

8. (Original) A steering control apparatus for an automotive vehicle as claimed in claim 7, wherein the actuator controlling section comprises a steering assistance controlling section that calculates the steering assistance quantity on the basis of a steering torque and the vehicle speed.

9. (Original) A steering control apparatus for an automotive vehicle as claimed in claim 8, wherein the actuator comprises an electrically driven motor of a power steering mechanism of the vehicle.

10. (Cancelled)